

Practitioner's Docket No. 76141.00101

PATENT

Inventor: Stephen E. Silverman (deceased), Asli Ozdas and Marilyn K. Silverman

Title: METHOD FOR ANALYSIS OF VOCAL JITTER FOR NEAR TERM
SUICIDAL RISK ASSESSMENT

Filing Date: October 5, 2001

Serial Number: 09/971,777

Group Art Unit: 2644

Examiner: Michael N. Opsasnick



SUPPLEMENTAL DECLARATION

As the named inventor on the above-referenced pending United States patent application, I hereby declare that I believe that I invented the subject matter that is presently claimed, in the United States patent application referenced above, and I am the original, first and joint inventor of such subject matter and further that I understand that the claim pending in the United States patent application referenced above is that attached hereto as Attachment 1.

I hereby further declare that the subject matter defined by the attached claim as currently pending in the above-referenced United States patent application was part of my invention and was invented by me before the effective filing date to which the application, as above identified, is entitled for the invention.

I hereby further state that I have again reviewed and affirm that I understand the contents of the application specification, including the claim pending in the application as such claim is attached hereto as Attachment 1.

I again acknowledge the duty to disclose information, which is material to patentability as defined in Title 37 of the Code of Federal Regulations of United States of America, Section 1.56, and which is material to the examination of the patent application as identified above, namely, information where there is a substantial likelihood that a reasonable patent examiner in the United States Patent and Trademark Office would consider that information important in deciding whether to allow the application to issue as a United States patent. I further declare and affirm that I have disclosed all such information through our attorneys to the United States Patent and Trademark Office and have received copies of such submissions as made to the United States Patent and Trademark Office from our attorneys.

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application referenced above or of any patent to issue therefrom.

Date: 10/01/06


Marilyn K. Silverman
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ATTACHMENT 1

1. A method for categorizing voice samples of a person being tested for near term suicidal risk and thereafter determining jitter variations in fundamental frequency of the voice of a person being evaluated for near-term suicidal risk, comprising the steps of:

- A. setting an analysis window to a selected sample set length of 512, where the particular sample is identified as the Kth sample;
- B. reading the Kth sample;
- C. computing wavelet transforms of such Kth sample for scales in powers of 2 running from the 1st power to the 5th;
- D. storing the signal energy value as computed for each scale;
- E. checking to determine whether the Kth sample is the last of the sample set and if additional samples remain, repeating steps “b” through “d”;
- F. setting the median energy distribution at the scale for 2 to the 4th power as a threshold;
- G. successively for each sample comparing the energy across the scales;
- H. if the maximum energy is at the scale for 2 to the 1st power, identifying the segment as unvoiced and proceeding to the next succeeding sample;
- I. if the segment maximum energy is at one of the scales of 2 to the 2nd power through 2 to the 5th power, identifying the segment as being either voiced or silence; and
- J. if the segment energy at the 2 to the 4th power scale exceeds the threshold, classifying the segment as voiced; otherwise classifying it as silence;

- K. identifying said segments classified as voiced as being suitable for testing of the person for near-term suicidal risk;
- L. selecting two consecutive segments voiced segments and generating separate pulse trains in which the heights of the pulses correspond to amplitude of positive and negative peaks of the wavelet transformed speech signal;
- M. thresholding the segments of the vocal signal to discard peaks corresponding to possible unvoiced samples;
- N. computing a fundamental period over the entirety of each of the two segments by:
 - finding the location of the first peak of the autocorrelation of the smoothed spectrum to the right of the zero lag component;
 - detecting a starting pulse exhibiting the property of being larger than both the pulse immediately preceding and immediately following such pulse and being greater than 50% of the global maximum of the pulse sequence;
 - locating following prominent pulses as detected in the neighborhood of expected locations determined by the peak of the autocorrelation sequence;
 - selecting, between two sequences of positive and negative peaks, the peak having the largest magnitude; and
 - taking the difference between two consecutive prominent pulses as the duration for the glottal cycle; and

- O. determining period-to-period fluctuation of fundamental frequency by measuring the difference between fundamental frequencies of two consecutive segments; and
- P. comparing the measured difference between fundamental frequencies of two consecutive segments for such person to variations in fundamental frequency for persons known not to be at near-term suicidal risk and providing a signal to a clinician in the event such comparison finds the person to be at near-term risk for suicide.

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SUPPLEMENTAL DECLARATION

I hereby declare that I am a citizen of the United States of America, residing at and having a mailing address as indicated below, and that I am authorized to execute this Supplemental Declaration as a representative of the estate of Stephen E. Silverman, one of the inventors of record on the patent application identified above.

As Stephen E. Silverman is one of the named inventors on the above-referenced pending United States patent application, I hereby declare that I believe that Stephen E. Silverman co-invented the subject matter that is presently claimed, in the United States patent application referenced above, and that Stephen E. Silverman was an original, first and joint inventor of such subject matter and further that I understand that the claim pending in the United States patent application referenced above is that attached hereto as Attachment 1.

I hereby further declare that I believe the subject matter defined by the attached claim as currently pending in the above-referenced United States patent application was part of the invention for which Stephen E. Silverman was a joint inventor and was invented by Stephen E. Silverman and his joint inventors before the effective filing date to which the patent application, as above identified, is entitled.

I hereby further state that I have reviewed the contents of the application specification, including the claim pending in the application as such claim is attached hereto as Attachment 1 and that I believe Stephen E. Silverman understood the contents of the application specification, including the claim pending in the application as such claim is attached hereto as Attachment 1.

I acknowledge the duty to disclose, on behalf of Stephen E. Silverman, information, which is material to patentability as defined in Title 37 of the Code of Federal Regulations of United States of America, Section 1.56, and which is material to the examination of the patent application as identified above, namely, information where there is a substantial likelihood that a reasonable patent examiner in the United States Patent and Trademark Office would consider that information important in deciding whether to allow the application to issue as a United States patent. I further declare that I understand and believe that Stephen E. Silverman disclosed all such information through his attorneys to the United States Patent and Trademark Office and that Stephen E. Silverman had received copies of such submissions as made to the United States Patent and Trademark Office from his attorneys.

I hereby further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so

made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application referenced above or of any patent to issue therefrom.

Marilyn Silverman, Executor
Name Printed Estate Stephen E. Silverman

Marilyn Silverman
Signature

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Residential Street Address

Weston Ct 06883
City and State / Mailing Address

Print above, as applicable, one of the following:
Executor or Administrator or Representative
of the Estate of Stephen E. Silverman

10/01/06
Date



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